

WHAT IS CLAIMED IS:

1           1. A system for monitoring an industrial process, the system  
2 comprising;  
3           a process controller; an input module coupled to the process controller, the  
4           input module being adapted to input a plurality of parameters from a process for  
5           manufacture of a substance;  
6           a computer aided process module coupled to the process controller, the  
7           computer aided process module being adapted to compare at least two of the plurality  
8           of parameters against a predetermined training set of parameters, and being adapted to  
9           determine if the at least two of the plurality of parameters are within a predetermined  
10          range of the training set of parameters; and  
11          an output module coupled to the process controller, the output module  
12          being adapted to output a result based upon the determining step.

1           2. The system of claim 1 wherein the substance is selected from a  
2           petroleum product, a chemical product, a food product, a health product, a cleaning  
3           product, a biological product, and other fluid or objects.

1           3. The system of claim 1 wherein the plurality of parameters are  
2           selected from an intrinsic element or an extrinsic element of the process.

1           4. The system of claim 1 wherein the input module, the computer  
2           aided process module, and the output module are provided in a computer software  
3           program.

1           5. The system of claim 1 wherein the computer aided process includes  
2           an algorithm selected from PCA, HCA, KNN CV KNN Prd, SIMCA CV, SIMCA Prd,  
3           Canon Prd, SCREAM, and Fisher CV.

1           6. The system of claim 1 further comprising a normalizing module  
2           coupled to the process controller, the normalizing module being adapted to normalize  
3           each of the plurality of parameters before input into the computer aided process module.

1           7. The system of claim 1 wherein the training step of parameters are  
2           preprocessed in at least two of the computer aided processes.

1                   8.       The system of claim 1 wherein the result is an affirmative response  
2       or a negative response, where the response is displayed on a terminal.

1                   9.       The system of claim 1 wherein the computer aided process is  
2       selected from a library comprising a plurality of processes.

1                   10.      The system of claim 9 wherein the plurality of processes includes  
2       at least a comparing process, a contrasting process, and a functional process.

1                   11.      A system for monitoring an industrial process for the manufacture  
2       of materials or objects, the system comprising:

3                   an input module, the input module being adapted to input a plurality of  
4       process parameters from a process for manufacture of a substance or object;  
5                   a library module coupled to the input module, the library module including  
6       a plurality of computer aided processes, each of the computer aided processes being  
7       capable of determining an output based upon a predetermined training set of the  
8       plurality of process parameters;

9                   an output module coupled to the library module, the output module being  
10      adapted to output a result based upon the predetermined training set and the plurality  
11      of process parameters;

12                 wherein each of the computer aided processes compares at least two of the  
13      plurality of process parameters against a portion of the training set of parameters and  
14      determines if the at least two of the plurality of process parameters are within a  
15      predetermined range of the portion of the training set of parameters.

1                   12.      The system of claim 11 wherein the substance is selected from a  
2       petroleum product, a chemical product, a food product, a health product, a cleaning  
3       product, a biological product, and other fluid or objects.

1                   13.      The system of claim 11 wherein the plurality of process parameters  
2       are selected from an intrinsic element or an extrinsic element of the process.

1                   14.      The system of claim 11 wherein the input module, the library  
2       module, and the output module are provided in a computer software program.

1                   15. The system of claim 11 wherein the computer aided process  
2 includes an algorithm selected from PCA, HCA, KNN CV KNN Prd, SIMCA CV,  
3 SIMCA Prd, Canon Prd, SCREAM, and Fisher CV.

1                   16. The system of claim 11 wherein the training set of parameters are  
2 preprocessed.

1                   17. The system of claim 11 wherein the process parameters comprise at  
2 least olfactory information.

1                   18. The system of claim 11 wherein the result is an affirmative  
2 response or a negative response, where the response is displayed on a terminal.

1                   19. The system of claim 11 wherein the library module comprises a  
2 plurality of processes.

1                   20. The system of claim 19 wherein the plurality of processes includes  
2 at least a comparing process, a contrasting process, and a functional process.

1                   21. A system for controlling a process, the system comprising:  
2                   a first field mounted device in communication with a process and  
3 configured to produce a first input; and  
4                   process manager receiving the first input and configured to apply a first  
5 model to the first input to identify a first predicted descriptor characteristic of a state of  
6 the process, and configured to consult a first knowledge based system to provide an  
7 output based upon the first predicted descriptor.

1                   22. The system of claim 21 wherein the process manager is a server in  
2 communication with the first field mounted device via a computer network.

1                   23. The product of claim 21 wherein the process manager is a server in  
2 communication with a user through a network of computers utilizing a browser software  
3 program.

1                   24. The product of claim 23 wherein the process manager is in  
2 communication with the first field mounted device via the computer network.

1                   25. The system of claim 21 further comprising a second field mounted  
2 device receiving the output and adjusting an operational parameter of the process  
3 according to the output.

1                   26. The system of claim 21 further comprising an output module  
2 including an interface between the process manager and an associated system including at  
3 least one of a legacy system, an e-enterprise system, and a desktop application.

1                   27. The system of claim 21 wherein the first knowledge based system  
2 is an expert system.

1                   28. The system of claim 21 wherein the model is constructed utilizing  
2 one of a univariate statistical technique, a multivariate statistical technique, a time series  
3 analysis, and a neural-based technique.

1                   29. The system of claim 21 further comprising a library configured to  
2 store one of a group of different algorithms utilized to construct the first model.

1                   30. The system of claim 21 further comprising a library configured to  
2 store one of a group of different algorithms utilized to construct the first model.

1                   31. The system of claim 21 further comprising a second model, the  
2 process manager configured to apply the second model to the data to identify a second  
3 predicted descriptor characteristic of the process data, the process manager further  
4 configured to produce the output based upon the first predicted descriptor and the second  
5 predicted descriptor.

1                   32. The system of claim 21 further comprising:  
2                   a second model; and  
3                   a second knowledge based system, the process manager applying the  
4 second model to the data to identify a second predicted descriptor characteristic of the  
5 process data, the second knowledge based system submitting one of the first predicted  
6 descriptor and the second predicted descriptor to the first knowledge based system where  
7 the first predicted descriptor is different from the second predicted descriptor.